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(54) A wobble board

(57) A wobble board comprises a support table, a base 12 and a pedestal 14 which intercouples the table and base 12. The pedestal 14 is coupled to the base 12 and to the table so as to permit the table to tilt relative to the base 12 and the pedestal 14 is of adjustable height; e.g. a socket is fixed relative to the base with a shaft threadedly received in the socket and a bearing connecting the top of the shaft to the table, thereby providing adjustment of the amount of tilt of the table relative to the base (12).

In one arrangement pin and slot means 46–50 are provided for limiting rotation of the table relative to the base 12, optionally springs being inserted in the slot. In another arrangement the wobble board has roller and buffer means (36, 38, Fig. 3) providing adjustable resistance to rotation of the table relative to the base 12. The buffer may include a close cell foam element covered by an outer layer of wear resistant material. A locking mechanism (30, Fig. 4) may lock the pedestal after height adjustment. The wobble board may be used in combination with a knee therapy chair.

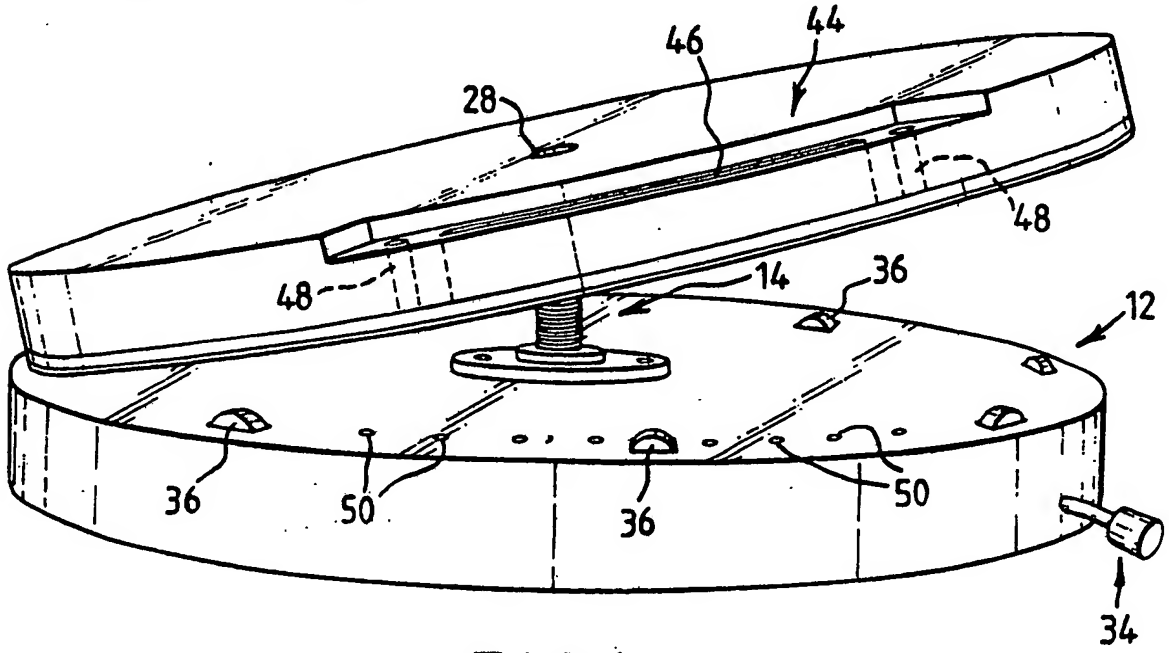

FIG.1.

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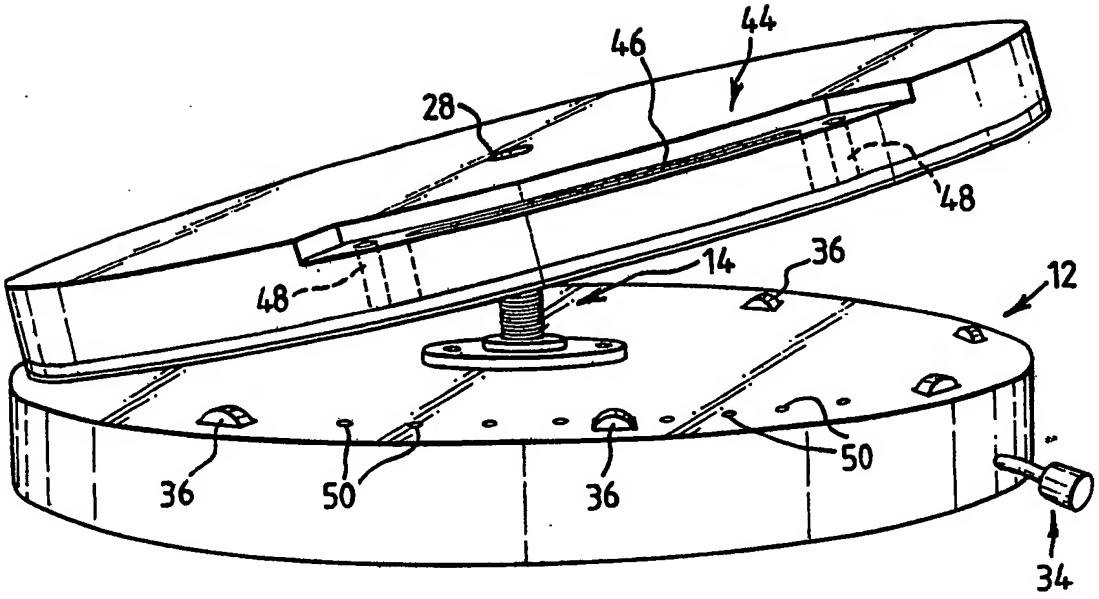

FIG.1.

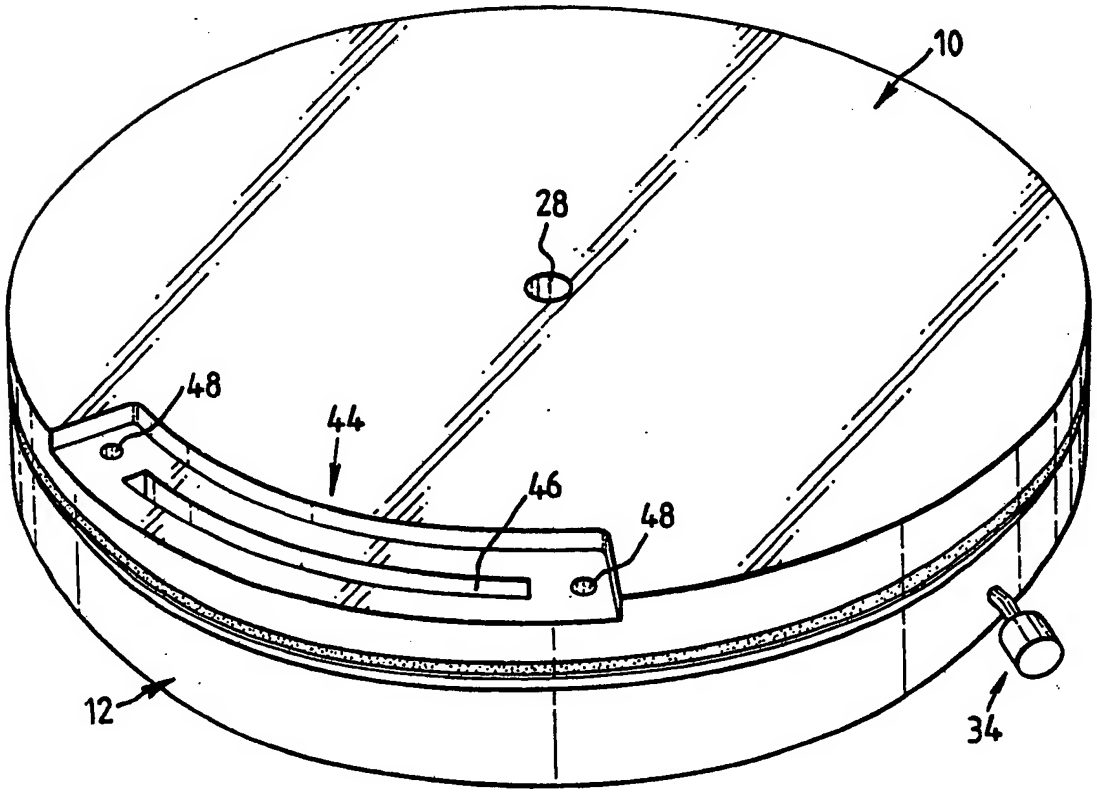

FIG.2.

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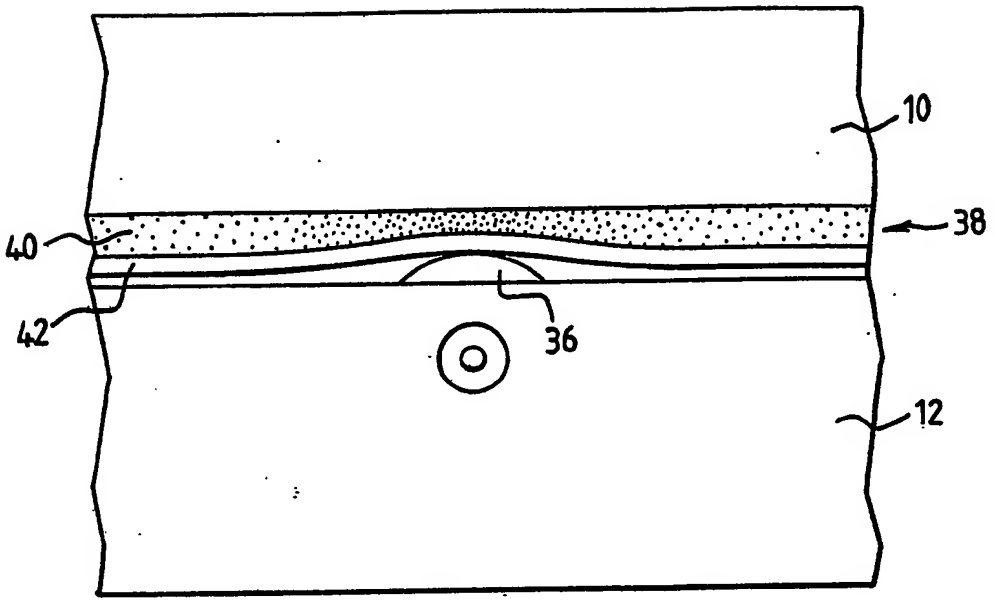

FIG.3.

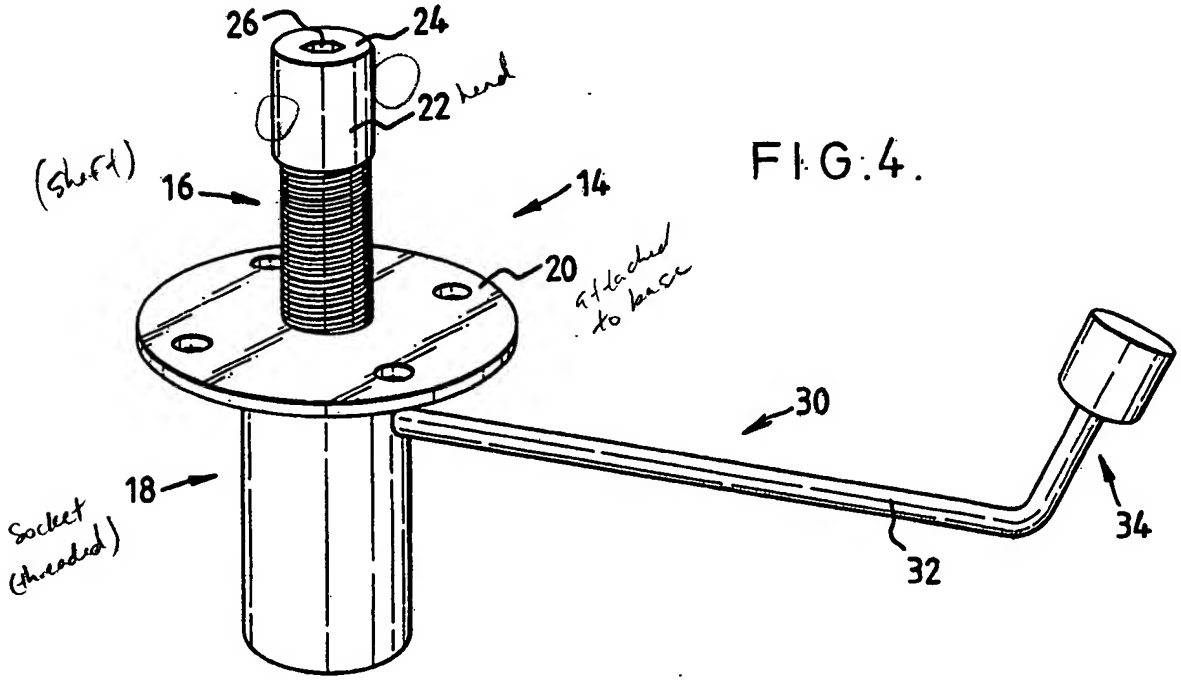

FIG.4.

SPECIFICATION

A wobbl board

The present invention relates t an apparatus known as a wobble board. Such apparatus is previously known and is used, primarily, in the rehabilitation of knee and ankle injuries.

Conventionally, wobble boards have had a simple construction such as a circular board with a hemispherical rocker attached centrally to the underside of the board. A patient stands on the board and adjusts his weight so as to cause the board to tilt, often the wobble board will also rotate. The tilting movement exercises the knee and/or ankle joints thus providing beneficial exercise particularly to assist with recovery from injury. To emphasise treatment of the ankle or to avoid strain on the knees, the wobble board may also be used by a patient when seated on a chair—so that the major part of the patients body weight is supported by the chair rather than by the wobble board.

Conventional wobble boards have the disadvantage that they are not adjustable and it is very difficult for a patient to use a conventional wobble board in order to increase gradually the degree of exercise obtained by the injured joint. In addition, in some circumstances the rotational movement of the wobble board can present a definite hazard.

With a view to mitigating the above mentioned disadvantages of known apparatus, the present invention provides in a first aspect a wobble board comprising a support table, a base, a pedestal and means for limiting rotation of the table relative to the base, the pedestal being coupled to the base and to the table so as to permit the table to tilt relative to the base and being of adjustable height, thereby providing adjustment of the amount of tilt of the table relative to the base.

The present invention is predicated upon the realization of the particular benefits which accrue from a gradual increase in the permissable amount of movement of the wobble board. In the first aspect of the invention, this includes not only the ability to adjust the maximum amount of tilt but also to limit rotation of the wobble board. In a second aspect of the invention provision is made for a gradual increase in ease with which the wobble board can rotate.

Thus, in a second aspect the present invention provides a wobble board comprising a support table, a base, a pedestal and means providing an adjustable resistance against rotation of the table relative to the base, the pedestal being coupled to the base and to the table so as to permit the table to tilt relative to the base and being of adjustable h ight, thereby providing adjustment of the amount of tilt of the table relative to the base.

The degree of control provided by the two aspects of the invention n t only enables cl se control of the speed of rehabilitation of an injured joint, but also provides important safety features absent from conventional wobble boards.

Embodiments of the invention will now be described by way of example only and with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of an embodiment of the invention, showing the wobble board adjusted for the maximum amount of tilt,

Figure 2 is a further perspective view of the embodiment shown in Figure 1, from a different angle and in a different position of adjustment,

Figure 3 is a partial side elevation of the embodiment of Figure 1, when adjusted as shown in Figure 2, and

Figure 4 is a perspective view of the adjustable pedestal which separates the table and base of the wobble board.

As best seen in figures 1 and 2, the wobble board comprises a support table 10 and a base 12 separated by an adjustable pedestal 14. The table and base are both disc shaped, with the table being of slightly smaller diameter than the base. The table 10 and base 12 are preferably formed of wood or a plastics material, whereas pedestal 14 is a metal component.

The pedestal 14 is shown separately in figure 4. Pedestal 14 comprises an externally threaded shaft 16 and an internally threaded socket 18. Socket 18 is provided at its upper end with an enlarged flanged 20 which supports the pedestal 14 in base 12, as best seen in figure 1. At the upper end of shaft 16, a slightly enlarged cylindrical head 22 is provided and this portion is not threaded. The head portion 22 forms an interference fit in a free moving bearing (not shown) which is secured in a rebate in the underside of table 10. Suitable free moving bearings are commercially available and one particular type which has been used successfully has a double race of balls held in a cage within an outer shell. The major characteristic of the free moving bearing is that it enables the planes of the inner and outer shells of the bearing to tilt relative to each other, as well as providing for relative rotation between the inner and outer shells.

The end face 24 of the head 22 on column 16 carries a central hexagonal recess 26 which accepts the end of the crank handle (not shown) so as to enabl shaft 16 to be rotated relative to socket 18, thereby adjusting the extent to which shaft 16 projects from the socket. Crank handle access to recess 26 is via a central aperture 28 which passes through table 10, as shown in figure 2.

Pedestal 14 is provided with a locking mechanism 30 which includes an elongated shaft 32 threadedly received in an aperture 34

which passes through the cylindrical wall of socket 18. Appropriate r tation of shaft 32, by means of a handle portion 34 causes the end of the shaft 32 to bear against the thread on shaft 16 and thereby prevent relative rotation between the shaft 16 and the socket 18. In order to improve this action, a small brass disc may be inserted into aperture 34 in advance of shaft 32, with the brass disc having a contoured face adapted to the thread on shaft 16.

Shaft 32 is sufficiently long so as to extend through a radial aperture in base 12 with the handle portion 34 located just beyond the periphery of the base, as shown in figures 1 and 2.

It will be readily apparent from the above description that adjustment of the extent to which shaft 16 projects from socket 18 controls the maximum amount of tilt between table 10 and base 12. This enables safe operation of the unit and gradual increase in the degree of movement of a patient's joint during rehabilitation of an injury.

As shown in figures 1 and 3, the upper surface of the base 12 carries a plurality of rollers 36. The rollers 36 are equally spaced on a circle corresponding to the edge portion of table 10. Rollers 36 cooperate with an annular buffer 38 carried on the underside of table 10, so as to enable a variable resistance to be applied against relative rotation of the table 10 relative to base 12. This can best be understood from figure 3. As illustrated, buffer 38 comprises two components, a close cell foam material 40 (such as EVAZOTE) and a wear resistant cover 42, formed of a material such as polypropylene.

As pedestal 14 is adjusted so as to lower table 10 towards base 12, the wear resistant surface 14 contacts the top of the rollers 36. As table 10 is brought closer towards base 12, the close cell foam 40 is compressed at the point above each roller 36, thus creating a resistance to relative rotation between table 10 and base 12. This condition is illustrated in figure 3. Clearly, as table 10 is further lowered onto base 12, the resistance increases until, with the table fully lowered, the base effectively become locked against relative rotation.

It will be appreciated that the buffer 38 is also advantageous when the wobble board is used in a tilting rather than rotational exercise, as it cushions the contact between the edge of the table and the base.

It is also to be noted that variable resistance to tilting of the table 10 can be provided by attaching elastics between the table 10 and base 12, around the peripheries thereof. The resistance provided by the elastics can be varied either by varying the elastics or by varying their effective length.

selective limitati n f the amount f relative rotation between table 10 and bas 12. This arrangement is best illustrated in figure 2.

An arcuate recess 44 is provided in the upper surface of table 10, such that the recess 44 is open both to the upper and edge surfaces of the table. An arcuate slot 46 is open to the base of the recess 44 and passes through the remaining thickness of the table. Slot 46 extends for most of the length of the arcuate recess 44, but a respective circular aperture 48, also passing through the remaining thickness of table 10, is located between either end of slot 46 and the extremes of recess 44. Slot 46 and apertures 48 are configured so as to receive pins (not shown) which pass therethrough and engage with respective circular recesses 50, located in the upper surface of base 12, as shown in figure 1.

If it is required that there should be no relative movement between table 10 and base 12, a pin is inserted through one of apertures 48 (or preferably respective pins are inserted through both apertures 48) and the table is thus locked against rotation. If it is required to limit relative rotation of table 10 with respect to the base 12 to a maximum of approximately 50°, a single pin is inserted through slot 46 so as to engage one of the apertures 50. In this condition, table 10 can rotate until the pin contacts either end of the slot 46. By using two pins which pass through slot 46 and which are located in apertures 50 which are spaced apart by a distance less than the arcuate extent of slot 46, the maximum rotation can be reduced. Thus, by the provision of the appropriate number and spacing of apertures 50, it may be possible to restrict relative rotation in say 10° steps, from the maximum of 50°.

As illustrated, table 10 has a plane upper surface and this may be provided with a non-slip covering. However, if the wobble board is to be used by a seated patient, foot straps may be provided on the upper surface of table 10. This configuration may be particularly beneficial if the wobble board is to be used in combination with a knee therapy chair of the type disclosed in U.K. patent 2112653. In this case, the wobble table replaces the foot straps described in that patent.

Various modifications may be made to the above described embodiment, as will be readily apparent to those skilled in the art, without departing from the scope of th present invention, as defined in the appended claims.

As one example of such modifications, reference will be made to the means for providing adjustable resistance to rotation of table 10. Instead of the described buffer 38 and roller 36 arrangement, use can instead be made of the peg and slot rotation limiting

secured in one f the apertures 50—with the directi n of compressi n of the springs being along the arcuate extent of the slot. As the table rotates ne f the springs is compressed and urges the table 10 back t its original position. Alternatively, one or both of apertures 48 can be threaded so as to receive a pin (or respective pins) which carry a roller on their lower end. The roller is forced against the upper surface of base 12, with the force being adjustable by the degree to which the peg is screwed into its aperture 48. Of course, in this arrangement the apertures 50 would not be provided or the peg roller designed so as not to interact with them.

CLAIMS

1. A wobble board comprising a support table, a base, a pedestal and means for limiting rotation of the table relative to the base, the pedestal being coupled to the base and to the table so as to permit the table to tilt relative to the base and being of adjustable height, thereby providing adjustment of the amount of tilt of the table relative to the base.

2. A wobble board comprising a support table, a base, a pedestal and means providing an adjustable resistance against rotation of the table relative to the base, the pedestal being coupled to the base and to the table so as to permit the table to tilt relative to the base and being of adjustable height, thereby providing adjustment of the amount of tilt of the table relative to the base.

3. A wobble board as claimed in claim 1 or 2, wherein the pedestal comprises a socket fixed relative to the base, a shaft threadedly received in the socket and a bearing connecting the shaft to the table.

4. A wobble board as claimed in claim 1, further comprising means for limiting rotation of the table relative to the base.

5. A wobble board as claimed in claim 1 or claim 5, wherein the means for limiting rotation of the table relative to the base comprises a peg and slot arrangement providing a range of angular limits to rotation of the table.

6. A wobble board as claimed in claim 1, further comprising means providing an adjustable resistance against rotation of the table relative to the base.

7. A wobble board as claimed in claim 2 or claim 6, wherein the means providing adjustable resistance comprise a buffer carried on the underside of the table and including a close cell foam element.

8. A wobble board as claimed in claim 7, wherein the close cell foam element is covered by an outer layer of wear resistant material.

9. A wobble board as claimed in any preceding claim, further comprising means providing adjustable resistanc to tilting of the table relative to the base.

ceding claim, further comprising a locking mechanism operative t l ck the pedestal after height adjustment.

11. A wobble b ard as claimed in claim 3, wherein the upper surface of the shaft is provided with means for receiving a crank handle which is passed through a central aperture in the table whereby the shaft may be rotated so as to provide the height adjustment.

12. A wobble board substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

13. A wobble board as claimed in any preceding claim, in combination with a knee therapy chair as claimed in United Kingdom pat nt 2112653.

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